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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of
Rosser et al.

Serial No.: 07/826,754

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For: TELEVISION DISPLAYS HAVING SELECTED INSERTED INDICIA

Group Art Unit: 2602

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Honorable Commissioner of
Patents and Trademarks
Washington, DC 20231

INFORMATION DISCLOSURE STATEMENT

Sir:

In accordance with the provisions of 37 C.F.R. §1.97-1.99, applicants and their attorney respectfully request that the following references be made of record in the official United States Patent and Trademark Office file for the above-identified application:

U.S. Patent No.	Patentee	Issue Date
2,921,124	R.E. Graham	January 12, 1960
3,016,518	W.K. Taylor	January 9, 19962
3,051,778	R.E. Graham	August 28, 1962
3,140,710	H.F. Glassner	July 14, 1964
3,315,222	Charles W. Bogs	April 18, 1967
3,470,468	P.H. Halpern	September 30, 1969
3,473,121	C.R. Hurtig	October 14, 1969
3,582,957	A.J. Herleikson	June 1, 1971
3,715,477	Olson	February 6, 1973
3,731,188	Smith	May 1, 1973
3,737,855	Alfred Cutaia	September 30, 1971
3,742,201	Groginsky	June 26, 1973
3,887,762	Uno	June 3, 1975
3,973,239	Kakumoto	August 3, 1976
3,983,328	Newell	September 28, 1976

3,996,421	Pruznick	December 7, 1976
4,000,399	Kawahara	December 28, 1976
4,010,446	Kawa	March 1, 1977
4,055,756	Jolviet	October 25, 1977
4,057,828	Monahan	November 8, 1977
4,134,134	Lux	January 9, 1979
4,163,258	Ebihara	July 31, 1979
4,205,341	Mitsuya	May 27, 1980
4,222,076	Knowlton	September 9, 1980
4,242,705	Ebihara	December 30, 1980
4,245,248	Netravali	January 31, 1981
4,261,018	Knowlton	April 7, 1981
4,261,043	Robinson	April 7, 1981
4,286,330	Isaacson	August 25, 1981
4,405,943	Kanaly	September 20, 1983
4,442,454	Powell	April 10, 1984
4,447,886	Meeker	May 8, 1984
4,463,381	Powell	July 31, 1984
4,513,317	Ruoff, Jr.	April 23, 1985
4,523,230	Carlson	June 11, 1985
4,661,986	Adelson	April 28, 1987
4,647,125	Carlson	June 16, 1987
4,692,806	Anderson	September 8, 1987
4,698,843	Burt	October 16, 1987
4,724,543	Klevecz	February 9, 1988
4,750,211	Wray	June 7, 1988
4,817,175	Tenenbaum	March 28, 1989
5,058,189	Kanno	October 15, 1991

British Application No.	Applicant	Filing Date
9019770.8	Rosser	September 10, 1990
9102995.9	Rosser et al.	February 13, 1991

TITLE	AUTHOR	PUBLICATION
FAST ALGORITHMS FOR ESTIMATING LOCAL IMAGE PROPERTIES	PETER J. BURT	IEEE 1982 pgs 669-671
PYRAMID-BASED EXTRACTION OF LOCAL IMAGE FEATURES WITH APPLICATIONS TO MOTION AND TEXTURE ANALYSIS	PETER J. BURT	SPIE VOL. 360 pgs 114-124

A copy of each of the aforementioned references is submitted herewith along with a completed form PTO-1449. The information provided herein was not submitted earlier because some of the listed references were unavailable when the application was filed. Moreover, a second patent search was conducted after the application was filed to update a prior search and to provide prior art that is more recent. The patent references listed on form PTO-1449 provide background information and are submitted for the Examiner's convenience. The following is a brief explanation of the more relevant references.

US Patent No. 3,731,188 entitled SIGNAL ANALYSIS OF MULTIPLICATIVELY RELATED FREQUENCY COMPONENTS IN A COMPLEX SIGNAL exemplifies apparatus that analyzes a frequency spectrum for frequency components that bear a relation to each other. In this patent, a plurality of synchronous or commutating filters for receiving a complex signal are provided. The center frequencies for each are adjustably determined by the frequency of a separate and applied reference signal. A controlled variable oscillator is connected to a frequency synthesizer which produces a plurality of outputs to the synchronous filters. The signals from the frequency analyzer are multiplicatively related to each other such that as the variable oscillator frequency changes, so do the frequencies of the outputs from the frequency analyzer while maintaining the multiplicative relationship. The output may then be applied to an individual rectifier and metering circuit.

The following patents are also related to signal analysis. US Patent No. 3,140,710 entitled METHOD AND APPARATUS FOR AUTOMATICALLY ANALYZING DISORDERS OF THE HUMAN BODY is directed to analyzing the energy spectrum of various heart sounds. Electrical circuits are then adapted for operation in response to the most significant characteristics of certain frequency components. These circuits also take into account such factors as the duration of the particular sound, the number of frequency portions of the spectrum throughout which significant energy is distributed, the order of appearance of different sound portions and the characteristics obtained by various operations performed on different sound portions, e.g. integration, differentiation, wave shape detection and frequency relationship. In this manner, each

grouping of electronic circuits is arranged to develop signal indications only in the presence of a sound of a predetermined character which is identifiable with a specific heart disorder.

In US Patent No. 3,315,222 entitled ELIMINATION OF UNDESIRED COMPONENTS OF SEISMOGRAMS, an undesired, high amplitude component of a seismogram is determined and eliminated. This is achieved by reproducing the seismogram traces as a single electrical signal, applying the signal through a notch-elimination filter to a bank of sharply tuned, narrow band pass filters of different adjacent pass bands, measuring the amplitudes of the output signals and varying the frequency of the notch filter until the highest amplitude output signal from the band pass filters is eliminated. The traces of the seismogram are then individually reproduced and applied to a recorder through the notch filter.

US Patent No. 3,470,468 entitled SYNTHESIS AND WAVE GENERATION WITH COMPACTLY CARRIED WAVEFORMS is directed to filter networks. In this patent, synthesis and analysis of compactly carried waveforms is performed by a circuit in which the voltage across and current through a frequency determining element of each of a plurality of filter sections of different resonant frequencies, related to the odd harmonic Fourier coefficients of the compactly carried waveform as applied to an input terminal to which all of the filter sections are coupled, are detected and converted to respectively related values of the same parameter for subsequent summation.

US Patent No. 3,743,121 entitled SPECTRUM ANALYSIS USING SWEPT PARALLEL NARROW BAND FILTERS is directed to a spectrum analyzer for analyzing the spectrum of an electrical signal of bandwidth R. A band of narrow band pass filters having non-contiguous pass bands are provided. Each of the pass bands are located in a portion of sub-band of the total bandwidth to be analyzed. The incoming signal is mixed with the signal from an oscillator whose frequency swept linearly and the inner output is supplied to each of the filters. Consequently, this simultaneously sweeps the pass bands of each of the narrow band filters over the sub-band in which it is located. The output from each of the filters is detected and displayed in such a fashion that a spectral analysis over the entire bandwidth is displayed.

US Patent No. 3,582,957 entitled FREQUENCY ANALYZER is directed to a system for analyzing and displaying the frequency components of a complex analog signal. This patent discloses the use of individual filter units arranged to pass different frequencies therethrough. The filter outputs are then commutated and a light beam is then modulated by the commutated energy. This light beam is cyclically swept across a sensitized recording medium in synchronism with each cycle of commutation so that the individual frequency components of the data signal are presented in a form suitable for instant analysis and evaluation.

An image processing method for reducing noise in the image is exemplified by US Patent No. 4,442,454 entitled IMAGE PROCESSING METHOD USING A BLOCK OVERLAP TRANSFORMATION PROCEDURE. This method is used particularly for reducing noise in an image divided into blocks of sampled image elements that are transformed by a linear procedure such as the Walsh-Hadamard transform. In addition, visible noise is improved by non-linear thresholding of the transform coefficients. The process includes a hierarchy of stages, wherein each stage employs a block operating on image signals derived from the preceding stage. Furthermore, the blocks processed in each stage are overlapped. In this manner, the processed signal from each image element is the linear combination of many transform coefficients from each stage and each overlapped block. This large number of contributions assures that the processed image is generated without a characteristic block-like structure due to block transform processing while the desired components of the image are rendered with minimal image loss or distortion. Other patents that disclose related subject matter are US Patent Nos. 3,715,477, 3,996,421, 4,055,756, 4,057,828, 4,134,124, 4,205,341, 4,242,705 and 4,245,248.

An example of a method and apparatus for transforming numerical signal data of a video signal is disclosed in US Patent No. 4,447,886 entitled TRIANGLE AND PYRAMID SIGNAL TRANSFORMS AND APPARATUS. A technique is shown for transforming numerical signal data into a transform domain wherein the technique includes subsequent reconstruction for purposes such as compression for communication or storage. The subject transforms involve several defined basis functions which operate on input data points. The basis functions of the invention are essentially weighting functions such that

terms and coefficients in the transform domain calculated in accordance with the basis functions are each a particularly weighted average of values of a selected consecutive plurality of input points. Successive terms and coefficients generated in accordance with each of the defined basis functions are calculated from successive consecutive pluralities of the input data points with overlap of input data points depending on the particular basis function.

US Patent No. 2,291,124 entitled METHOD AND APPARATUS FOR REDUCING TELEVISION BANDWIDTH is directed to reducing the channel capacity required of communication systems. This is achieved by reducing the redundancy in the signals which are transmitted in a manner such that quantizing or complex coding techniques are unnecessary. Specifically, preselected signal periods of a signal wave train having a continuous succession of signal periods are discarded prior to transmission of the wave train. The retained periods are transmitted to a receiving station unencoded, preferably after stretching each one in time to fill the gap left in the wave train by the elimination of certain periods. Such stretching carries with it a corresponding reduction in the frequency band required for transmission. At the receiving station the received wave is restored to its original dimension in time to produce a facsimile of the transmitted wave including the blank intervals corresponding to the eliminated periods. In this patent, signal interpolation is employed to produce, solely from information in the received signal, a signal wave equivalent to the period discarded prior to transmission. This signal is subsequently intercalated with the received periods to yield a substantial replica of the original signal.

Another patent related to transformation techniques is US Patent No. 3,051,778 entitled SEQUENTIAL SCAN TELEVISION WITH LINE INTERPOLATION. This patent relates to a system for transmitting only a fraction, e.g. one half, of the total number of lines in a conventional interlaced television frame signal and supplying the missing lines at a receiver station by means of logical interpolation. In this system, a delay of approximately one horizontal line duration is required. Other patents that disclose related subject matter are US Patent Nos. 3,742,201, 4,222,076, 4,261,018, 4,261,043 and 4,286,330.

The "Burt Pyramid" is described in US Patent No. 4,674,125 entitled REAL-TIME HIERARCHAL PYRAMID SIGNAL PROCESSING APPARATUS. This patent describes the use of pipe line architecture for analyzing in delayed real time the frequency spectrum of an information component of a given temporal signal having a highest frequency no greater than a predetermined value, and/or for synthesizing in delayed real time such a temporal signal from the analyzed frequency spectrum thereof. This type of pipe line architecture is particularly adapted for image processing the two dimensional spatial frequencies of television images defined by a temporal signal. Other information regarding the Burt Pyramid may also be found in the publications entitled FAST ALGORITHMS FOR ESTIMATING LOCAL IMAGE PROPERTIES and PYRAMID-BASED EXTRACTION OF LOCAL IMAGE FEATURES WITH APPLICATION TO MOTION AND TEXTURE ANALYSIS.

Coring techniques have also been utilized to reduce a noise component of an image signal. This is exemplified in US Patent No. 4,523,230 entitled SYSTEM FOR CORING AN IMAGE-REPRESENTING SIGNAL. In this patent, a non-ringing, non-aliasing, localized transfer, octave-band spectrum analyzer is used for separating the video signal representing the image into subspectra signals. In addition, separate coring means are utilized for one or more of the analyzed subspectra signals. A synthesizer is then used employing one or more non-ringing, non-aliasing filters for deriving an output image-representing signal from all of the subspectra signals. In this manner, noise reduction is achieved without the introduction of noticeable artifacts in the displayed image. Furthermore, it is understood that the Burt Pyramid described in US Patent No. 4,674,125 may be utilized in conjunction with this patent. Other patents that disclose related subject matter are US Patent Nos. 4,163,258 and 4,463,381.

US Patent No. 4,692,806 entitled IMAGE-DATA REDUCTION TECHNIQUE is directed to a technique for reducing image data by utilizing a foveated electronic camera which may be operated automatically or semi-automatically. Specifically, the camera utilizes a spatial frequency spectrum analyzer and data reduction means employing movable spatial windows for converting a high resolution, wide field of view (fov) image into a group of subspectrum band images. Furthermore, these band images range in

resolution and fov from a lowest resolution image of the entire fov to a highest resolution image of a selectably positionable smallest spatial subregion of the entire fov. Other patents disclosing related subject matter are US Patent Nos. 3,016,518, 3,983,328, 4,405,943 and 4,513,317.

Furthermore, US Patent No. 4,698,843 entitled METHOD FOR COMPENSATING FOR VOID-DEFECTS IN IMAGES discloses a method for filling in void defects in an image which may be utilized in conjunction with the Burt Pyramid described in US Patent No. 4,674,125. In this patent, a multistage pyramid analyzer is modified to include extrapolation of the input to each stage. This is used in conjunction with a pyramid synthesizer for filling in one or more void defects in an image to provide a natural looking processed image. Other patents disclosing related subject matter are US Patent Nos. 3,737,855, 3,887,762, 3,973,239, 4,000,399, 4,010,446 and 4,661,986.

US Patent No. 4,724,543 entitled METHOD AND APPARATUS FOR AUTOMATIC DIGITAL IMAGE ANALYSIS is directed to digitally analyzing continuous visual images useful for the identification of dividing cells. In this patent, visual images are analyzed by first extracting high frequency picture components and probing for annular objects which are indicative of mitotic cells. The detection of the annular objects is performed by an algorithm for recognizing rings of differential radii. Then, spatial and temporal relationships between such objects are stored and compared to determine whether cell division occurred.

US Patent No. 4,750,211 entitled METHOD AND APPARATUS FOR IMAGE PROCESSING WITH FIELD PORTIONS is directed to a method and apparatus whereby a computer with limited capacity can process a relatively large field of image information. In this patent, operations are performed on a relatively coarse representation of the full field and on a high resolution representation of only a portion of the full field. The partial results from operations on field portions may then be formatted to yield a composite result for the full field. A photographic record of the image information may be read to provide full field representation and read again to provide field portion information. This portion by portion processing of image information enables a computer with relatively small memory to execute complicated image processing tasks.

In US Patent No. 4,817,175, entitled VIDEO STREAM PROCESSING SYSTEM, an improved video processing system is disclosed. The system comprises a modular family of image processing and pattern recognition submodules. The submodules perform different discrete tasks on a stream of video data. Each submodule includes a standard video interface and a standard processor interface. A pipeline pixel bus couples a number of submodules in series to enable video rate processing wherein each submodule performs a discrete task under control of a central processor.

US Patent No. 5,058,189 entitled APPARATUS AND METHOD FOR AREA DESIGNATION ON A DOCUMENT is directed to method for designating a rectangular area on a document. In this process, pixel data of a sheet having a figure drawn thereon is stored in memory. The data of a pixel of interest and data of pixels adjacent thereto are sequentially read out from memory by scanning the memory in accordance with each of four combinations of the main and sub scanning directions. A first logic operation is performed with respect to the pixel data read out from memory in each combination of the scanning directions. Furthermore, the results of the logic operations are then stored in memory. A second logic operation is performed on the results of the first logic operation which is obtained in each combination of scanning directions. A group of the results of the second logic operation with respect to each of the scanned pixels represents the rectangular area having the drawn figure as an inscribed figure and is filled in with pixel data having a value identical to that of the pixel data to form a contour image of the drawn figure.

The present invention requires precise positioning of a new image into an existing image. Pattern recognition apparatus is utilized to recognize preselected features of a typical television scene. These features can then be used to locate the size, position and perspective of an artificial electronic advertisement on the scene such that it appears to a viewer as if it were a part of the original scene. As can be readily ascertained, these features are not shown by the prior art.

This Information Disclosure Statement is being submitted pursuant to 37 CFR 1.97-1.99. Consequently, no fee is due. If there are any other fees due and owing, please charge our Deposit Account No. 16-2131.

Respectfully Submitted,

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Karol Genesta Rice Oct 20, 1992
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